Star of Innovation

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Minnesota Association of Secondary School Principals

Star of Innovation Award Application Form

School Name Monticello Middle School Grade Levels 6-8

Name of School District Monticello Public Schools, ISD #882

Name of Principal Mr. Jeff Scherber

Application Submitted By Mr. Jeff Scherber

School Street Address 800 Broadway St E

City, Zip Monticello, MN 55362

Telephone Number 763-272-2100

MASSP Division Central

Name of Program STEM Program

Please answer the following questions on a separate sheet/s of paper.

- Description of the program.
- How has it impacted your school?
- What difficulties did you encounter in its implementation?
- What issue/s might another school encounter in replicating this program?
- Do you have any data to show the impact of this program? If so, please share it with us.

Applications must be submitted to MASSP offices by March 1.

PHONE: 612-361-1510 • FAX: 612-361-6340
MASSP • 2 Pine Tree Drive • Suite 380 • Arden Hills, MN 55112

Questions? Please contact:
Bob Driver, Executive Director
612-361-6159

Monticello Middle School

800 Broadway East Monticello, MN 55362
Phone: 763-272-2100 | Fax: 763-272-2109

Please consider our STEM Program as a recipient for the MASSP Star of Innovation Award. We are very proud of our innovative and collaborative program. We are currently in our second year of implementation. The proposal attached will outline a description of the program and how it came to fruition. We will also outline how it has impacted our school and community. To support other schools that may consider replicating this program, we will share some of the challenges we encountered and the approach we took to address barriers to implementation.

Role of the Principal

I have been fortunate to be the Principal of two high performing teachers. These teachers approached me and asked for support to address some of the curricular and logistical challenges they were experiencing in our STEM classroom and with our curriculum. These two teachers; Casie Monson and Jill Kedrowski shared that the existing STEM program was not meeting the needs of our middle school students. It was outdated and lacked the relevant hands-on career and college-ready curriculum the students needed. To address these concerns we met with district leadership and curriculum specialists. We presented baseline data, proposed a new curriculum, and requested professional development.

Observed Professional and Personal Growth

As a principal, I have been very impressed with the professional growth I have seen in both Jill and Casie. From the moment they proposed the innovative changes I have seen passion and excitement. I have observed them presenting at community organizations, Monticello Lions Club, Monticello Rotary, and Monticello Chamber of Commerce. I have seen them field questions and engage our community in these lasting partnerships. Most recently, Jill and Casie presented with students at the Minnesota School Board Association Leadership Conference.

Impact on our Students

One of the first things we noticed was the impact the program has on reaching out to our diverse student population. Students who may struggle in some of the core classes have shared that the labs provide an opportunity for them to be leaders. The novelty of the curriculum provides a level playing field. Students are more comfortable with hands-on experiences in the labs. It is fascinating to see these students are the ones who shine the most in our STEM classroom.

Students have shared the curriculum and helped build a connection with conversations at home. Parents are very interested to hear about the day's lab challenges. Whether it is drywall application, electrical circuits, or ophthalmology, students are eager to share what they have learned when they get home.

Impact on our School and Community
As a result of Casie and Jill's hard work, perseverance, and dedication to both the students and the field of education, we now have a state-of-the-art STEM program. We have partnerships with our community and families and we have sponsorships from local and corporate enterprises.

We have regular classroom visits from community leaders and business owners, working side-by-side with our middle school students. These connections provide relevance and a rationale for students to be engaged with the lesson. Many times these classroom visitors are parents or family members of students who are working in the field and applying specific knowledge. For some community members, their visit was the first time they stepped into our school. These community members get the chance to visit with middle school students and hear about how excited they are about the program and why it is different from other classes. Some have shared that it has opened their eyes to what challenges are on the minds of middle school students. Our local mayor and other community leaders are familiar faces in our classroom. Monticello is a rich business and trade community. These opportunities offered at the middle school level are exactly what local businesses have been asking for. It has been a very fulfilling partnership.

Support Building-wide Literacy Strategies
Casie and Jill have also incorporated technical reading and writing components for each station. Students are asked to take the excitement from the lab and share it in a persuasive essay. Embedded school-wide vocabulary and literacy strategies are a key component of each lab. Casie and Jill work collaboratively with other Middle School teachers to incorporate core curriculum concepts into their lessons.

Our Story -Jill Kedrowski and Casie Monson

Description of the program
Our names are Casie Monson and Jill Kedrowski; we teach STEM to all 7th and 8th graders at Monticello Middle School. Recently we have created a "STEM Lab" where students participate in hands-on modules that are college and career-focused. Experiences in the lab will help students make more informed decisions when experiencing our school-wide career pathways program at Monticello High School.

The lab includes 19 different modules:

- Alternative Energy
- CAD and Design
- Computer Graphics and Game Design
- Electricity and Electronics
- Research and Development (CO2 cars)
- Medical Imaging
- Sports Medicine
- Dentistry
- Nursing
- Home Maintenance Systems
- Home Maintenance Fundamentals
- Ophthalmology
- Intro to Engineering
- Biomedical Engineering
- Criminalistics
- Energy and Power
- Flight and Drones
- Structural Engineering
- NEW Digital Manufacturing
- Coming Soon - our 20th module: Environment and Ecology

Over the past five years, the wood shop was used as storage space since we no longer had a licensed Industrial Technology teacher in the building. Our STEM classes started focusing more heavily on Computer Science applications, especially when teaching during COVID. Although the units were engaging, we found the amount of screen time draining for students. The wood shop needed reconfiguration to give our students hands-on, technical education experiences again. The question was: "How do we make our vision a reality?". After doing quite a bit of research, we chose a curriculum called Paxton Patterson. This curriculum further challenges students by asking focused questions, requiring technical writing, and a final assessment to gauge learning.

We made our official change Fall of 2022. We dove in with a co-teaching model that we feel is unique and has made our lab offering stronger. We also attempt to use all six methods of co-teaching while in the lab or doing the student-prep "courses" before the lab. These methods are: One Teach - One Observe, One Teach - One Assist, Parallel Teaching, Station Teaching, Alternative Teaching, and Team Teaching. Since we are technically teachers for different grade levels, we were still often working alone or in our own little "silo". Making this leap allowed us to take risks and experiment with a HIGH level of collaboration.
We are the only school in Minnesota with this magnitude of a lab for middle school learners. Also, when comparing our school to the other districts in the country that use the curriculum, we put far more students through the content than other schools, due to our class being mandatory for all students vs. elective. This means we are reaching ALL learners from different ethnic backgrounds, socioeconomic statuses, genders, and ability levels.

How has it impacted your school?
When you walk into the STEM lab, the first thing you will notice is a buzz of engagement. Students are applying skills they are learning in other classes - whether it be STEM courses like Science, Technology, Engineering, and Math - or putting their narrative/argumentative writing skills to the test. Students notice the connections between all subjects. Not only do we hear students making connections within our class about topics covered in another course, but we are finding that they are bringing conversations about their hands-on experiences in our lab to their current classes to solidify their understanding of content across the subjects.

Potentially even more importantly, we have started to make community connections in several ways. First, as teachers, we have learned how to reach out to local community members and businesses to keep this program sustainable. People in our community and businesses we had not even known about have become a part of our monthly communication. We have created social media pages for businesses, community members, and parents of students to keep up with the hard work students are doing as well as the opportunities that they are getting in our lab that they may not receive anywhere else. Community members and businesses have offered many donations because of their strong belief in the program.

We have also had community members and businesses visit our STEM lab during school hours, so students can "show off" their experiences and speak about their learning. Students have even had the opportunity to be filmed by the Teaching Channel, speak at the Minnesota School Board Association Leadership Conference, and meet/connect with members of the Minnesota Department of Education. These experiences are ones that students will never forget and have only extended their learning. In April, we will have our second annual STEM showcase. Last Spring over 120 parents and community members attended this evening event.

What difficulties did you encounter in its implementation?
SPACE: Our first challenge was coming up with the classroom space for the labs. We eventually converted our old Industrial Technology shop into a STEM lab. Our current plans are to open the walls between the two classrooms to provide a more collaborative space.

Ongoing Costs: There are some costs for consumable items with some labs. We have been very fortunate as local businesses have stepped up to cover the cost of consumables. Polaris Corporation is providing the small engines and supplies for our Small Engine lab. Stellas Health has donated money to cover the cost of our biomedical station. These are just some of the examples of our partnership with local businesses and agencies.

What issues might another school encounter in replicating this program?
Considerations for Implementation:

The Need to Establish a Cohesive 6-12 Curriculum
This program can not be implemented as a stand alone curriculum. Teachers must work in conjunction with high school course offerings and opportunities. Casie and Jill have partnered with our high school counselors and teachers. Now as part of the curriculum, the high school counselors and careers teachers present in our STEM classes and walk through the high school course offerings as they consider careers and college programming prior to 9th grade registration.

Lesson Design and Delivery Model
The lesson design requires a teacher to be very organized. Each station has a different objective and learning target. Casie and Jill have asked students to identify the learning target and measure their progress each day. This individual assessment is a key component of student engagement and learning. This took some time to structure, but now each classroom has a seamless and logistical process and approach. There is a culture of expectation of ownership in each station.

Cost Of Curriculum
Each lab cost between $3,000-$4,000. The front end total was $75,000 for 18 lab stations. Considering the two grade levels -two semester courses we felt this was an excellent investment. All 7th and 8th graders get a chance to experience the labs. We have been very fortunate as some local connections to corporate offices helped solidify the sponsoring of an entire lab station.

Data to show the impact of this program

Chart for Sponsorships and Partnerships

STEM Lab Presentation

Monticello Times: MSBA Leadership Conference

Monticello Times: MDE Visits

Twitter: @STEMLabMMS

Facebook: STEM Lab - Monticello Middle School

Instagram: @montistemlab

Mr. Scherber,

Thank you so much for bringing the STEM lab to the middle school. My daughter presented CAD at the showcase last week and my husband and I were so impressed with the lab. How amazing for the kids to have this class!

Olivia's become obsessed with CAD and begged us to get her CAD at home (which we are), enroll her in some Outschool architecture courses this summer, and has begun researching colleges with architecture programs . While I realize she's only in 7th grade and her career goals may certainly change over time, this class and lab has fueled such a wonderful path for her.

Much thanks to you and her and Ms. Monson who make this awesome class possible!

Kristina Stewart